

CLAIMS

What is claimed is:

- 1 1. A laminate for use as a battery housing, comprising:
 - 2 (a) a sealant layer that is capable of acting as a barrier to an
 - 3 electrolyte, the sealant layer having an internal surface that is substantially inert to the
 - 4 electrolyte and an external surface;
 - 5 (b) a barrier layer comprising a first layer of metal foil and a second
 - 6 layer of metal foil adjacent to the first layer, the barrier layer having a first surface
 - 7 disposed adjacent to the external surface of the sealant layer and an external surface.
- 1 2. The laminate of claim 1, further comprising a layer of adhesive
- 2 material between at least one pair of layers selected from the first and the second layers
- 3 of metal foil and the sealant layer and the first layer of metal foil.
- 1 3. The laminate of claim 1 wherein the first and second layers of
- 2 metal foil comprise aluminum foil.
- 1 4. The laminate of claim 1 wherein the first layer and the second
- 2 layer of metal foil each have a thickness of between 6 micrometers and 120
- 3 micrometers.
- 1 5. The laminate of claim 1 wherein the sealant layer is a polymer.
- 1 6. The laminate of claim 5 wherein the sealant layer is selected from
- 2 the group consisting of polyesters, polyamides, polyvinylchlorides, fluoroplastics, and
- 3 polyolefins.
- 1 7. The laminate of claim 5 wherein the polymer is selected from the

2 group consisting of low density polyethylene, high density polyethylene, medium
3 density polyethylene, linear low density polyethylene (LLDPE), two-ply high density
4 polyethylene/linear low density polyethylene, ethylene interpolymers, polyethylene
5 terephthalate, polypropylene, polychloro-trifluoroethylene, polyphenylene sulfide,
6 ethylene vinyl acetate, ethylene vinyl alcohol, nitrile resin films, nylon, rubber, and
7 combinations thereof.

1 8. The laminate of claim 1, further comprising a protective layer
2 having a surface disposed adjacent to the external surface of the moisture barrier layer.

1 9. The laminate of claim 8 wherein the protective layer is a
2 polymer.

1 10. The laminate of claim 9 wherein the protective layer is selected
2 from the group consisting of polyesters, polyamides, polyvinylchlorides, fluoroplastics,
3 polyacrylonitrile, and polyolefins.

1 11. The laminate of claim 9 wherein the polymer is selected from the
2 group consisting of low density polyethylene, high density polyethylene, medium
3 density polyethylene, linear low density polyethylene (LLDPE), two-ply high density
4 polyethylene/linear low density polyethylene, ethylene interpolymers, polyethylene
5 terephthalate, polypropylene, polyacrylonitrile, polychloro-trifluoroethylene,
6 polyphenylene sulfide, ethylene vinyl acetate, ethylene vinyl alcohol, nitrile resin films,
7 nylon, rubber, and combinations thereof.

1 12. The laminate of claim 1 wherein sealant layer contains an
2 absorbent material.

1 13. The laminate of claim 12 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,

4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 14. The laminate of claim 2 wherein the adhesive contains an
2 absorbent material.

1 15. The laminate of claim 14 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 16. The laminate of claim 8 wherein the protective layer contains an
2 absorbent material.

1 17. The laminate of claim 16 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 18. The laminate of claim 1, further comprising an absorbent material
2 coated onto the internal surface of the sealant layer.

1 19. The laminate of claim 18 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 20. A laminate for use as a battery housing, comprising:
2 (a) a sealant layer that is capable of acting as a barrier to an
3 electrolyte, the sealant layer having an internal surface that is substantially inert to the
4 electrolyte and an external surface;
5 (b) an absorbent material pattern printed on the internal surface of

6 the sealant layer.

1 21. The laminate of claim 20 wherein the absorbent material is a
2 moisture absorbent selected from the group consisting of molecular sieves, magnesium
3 phosphate, calcium sulfate, silica gel, activated charcoal, water absorbent resins, and
4 combinations thereof.

1 22. The laminate of claim 20 wherein the absorbent material is a
2 hydrofluoric acid absorbent selected from the group consisting of activated alumina,
3 activated charcoal, molecular sieves, clays, titanium oxide, zirconium oxide, calcium
4 oxide, and combinations thereof.

1 23. The laminate of claim 20 wherein the sealant layer contains an
2 absorbent material.

1 24. The laminate of claim 20 further comprising a barrier layer
2 characterized by an internal surface that is disposed adjacent to the external surface of
3 the sealant layer and an external surface.

1 25. The laminate of claim 24 wherein the barrier layer contains an
2 absorbent material.

1 26. The laminate of claim 24, further comprising an adhesive
2 material between the sealant layer and the barrier layer.

1 27. The laminate of claim 26 wherein the adhesive material contains
2 an absorbent material.

1 28. The laminate of claim 24, further comprising a protective layer
2 characterized by an internal surface that is disposed adjacent to the external surface of
3 the barrier layer and an external surface.

1 29. The laminate of claim 28 wherein the protective layer contains an
2 adhesive material.

1 30. The laminate of claim 28, further comprising an adhesive
2 material between the protective layer and the barrier layer.

1 31. The laminate of claim 30 wherein the adhesive material contains
2 an absorbent material.

1 32. A housing for a battery, comprising:
2 (a) a laminate comprising a sealant layer that is capable of acting as a
3 barrier to an electrolyte, the sealant layer having an internal surface that is substantially
4 inert to the electrolyte and an external surface, wherein the laminate is fashioned into a
5 pouch having at least one seam that is double sealed by a first and a second sealing
6 region such that a channel is defined between the first and the second sealing regions;
7 and

8 (b) an absorbent material located within the channel defined by the
9 first and second sealing regions of the double seal.

1 33. The laminate of claim 32 wherein the absorbent material is a
2 moisture absorbent selected from the group consisting of molecular sieves, magnesium
3 phosphate, calcium sulfate, silica gel, activated charcoal, water absorbent resins, and
4 combinations thereof.

1 34. The laminate of claim 32 wherein the absorbent material is a
2 hydrofluoric acid absorbent selected from the group consisting of activated alumina,
3 activated charcoal, molecular sieves, clays, titanium oxide, zirconium oxide, calcium
4 oxide, and combinations thereof.